PREPARATION OF THE ANNUAL RAD-NESHAP REPORT

Purpose

This Meteorology and Air Quality Group (MAQ) procedure describes the methods for obtaining information needed to prepare the annual Rad-NESHAP dose report as required by 40 CFR Part 61.94 of Subpart H, obtaining peer review, and for generating the report in the DOE-specified format. The report for the previous calendar year is due to EPA by June 30th.

Scope

This procedure applies to the preparation of the annual report to the EPA of the calculated dose (calculated according to MAQ-501, -502, and –510) along with the other information specified in 40 CFR 61.94(b)(1-9). These same methods may be applied to monthly reporting, as necessary.

In this procedure

This procedure addresses the following major topics:

Hazard Control Plan

The hazard evaluation associated with this work is documented in MAQ-HCP-Office Work.

Signatures

Prepared by: (signed) Keith W. Jacobson, MAQ	Date: 12/10/2003
Approved by: (signed) Dave Fuehne, Rad-NESHAP Project Leader	Date: 12/10/2003
Approved by: (signed) Terry Morgan, QA Officer	Date: 12/10/2003
Approved by: (signed) Jean Dewart, MAQ Group Leader	Date: 12/10/2003

01/06/04

General information about this procedure

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Air Effluent Sources and Receptor Locations for Rad-NESHAP Evaluations	1
2	Suggested Receptor Locations for Rad-NESHAP Evaluations	1

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description of changes
0	9/2/98	New document.
1	9/13/99	Incorporate steps used to generate tables for the report, identify critical elements of database and software used.
2	6/18/01	Added steps regarding the determination of the location of maximum dose.
3	12/16/03	Added a reminder to include any accidental releases in calculation of annual emissions and provided additional guidance on calculating dose at various receptor locations, added attachments 1 and 2, and included additions to the annual report.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- Rad-NESHAP project leader
- person who prepares the Rad-NESHAP report

Annual retraining is required and will be by **self-study** ("**reading**") training.

Training method

The training method for this procedure is **self-study** ("**reading**"**)** and is documented in accordance with the procedure for training (MAQ-024).

General information, continued

Definitions specific to this procedure

Facility: defined by the regulation as all buildings, structures and operations on one contiguous site.

Residence: defined in the regulation as any home, house, apartment building, or other place of dwelling which is occupied during any portion of the relevant year.

Member of the Public: defined in the regulations as any off-site point where there is a residence, school, business, or office.

Receptor: defined for the Rad-NESHAP program at LANL as a location to be evaluated for effective dose equivalent to a member of the public, as a non-LANL building (on-site or off-site) that is occupied by a member of the public during any portion of the relevant year, but remains stationary and permanent such that its location can be determined on an annual, one time per year review.

Point Source: 1) The release point must be stationary (Title III of the Clean Air Act), AND 2) the effluent discharged from the operation or building must be "actively exhausted through a forced ventilation system via a single point" (FFCA), AND 3) the operation must have the potential to emit radionuclides "based on the discharge of the effluent stream that would result if all pollution control equipment did not exist, but the facilities operations were otherwise normal" (40 CFR 61.93.b.4.ii).

New Source Review: the evaluation of any proposed, new or modified project, operation, or activity at the Laboratory against air quality requirements for compliance, monitoring, and permitting.

Non-Point Source: any airborne radionuclide emission that is not considered a point source.

Release Site: any point or non-point source at LANL.

General information, continued

References

The following documents are referenced in this procedure:

- MAQ-024, "Personnel Training"
- MAQ-126, "Performing a Radiological Air Emissions Usage Survey Interview"
- MAQ-501, "Dose Assessment Using CAP88"
- MAQ-502, "Air Pathways Dose Assessment"
- MAQ-510, "Generating Annual CAP88 Input Files for LANL Monitored Stacks"
- MAQ-RN, "Quality Assurance Project Plan for the Rad-NESHAP Compliance Team"
- Memo ESH-17:99-366, "Demonstrating Compliance with the Reporting Requirement 40 CFR 61.94(b)(8)"
- LA-13469-MS, "Population Array and Agricultural Data Arrays for the Los Alamos National Laboratory," July 1998
- DOE-EH-89-9 bulletin, "Technical Software Quality Assurance Issues"
- DOE-EH-91-1 bulletin, "Computer Code Quality Assurance"
- Title 40 Code of Federal Regulations Part 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities," December 15, 1989
- FFCA, "Appendix A Compliance Plan" of the "Federal Facility Compliance Agreement," June 1996.

Note

Actions specified within this procedure, unless preceded with "should" or "may," are to be considered mandatory guidance (i.e., "shall").

Required report information and data

Background

The specific reporting requirements listed under 40 CFR 61.94 state that compliance to the standard in 40 CFR 61.92(a) is achieved by: 1) "calculating the highest effective dose equivalent to any member of the public at any off-site point where there is a residence, school, business or office" and, 2) annual reporting of the calculated dose along with the information specified in 40 CFR 61.94(b)(1-9).

Requirements for 1) above are satisfied by procedures MAQ-501, -502, and -509. The information generated by these procedures is used to generate the annual report (described in this procedure) as required by 2) above.

The Department of Energy also requires a specific format to the report and requests additional information. Also, as part of the 1996 Federal Facilities Compliance Agreement (FFCA) between LANL and EPA Region VI, LANL is required to include additional monitoring information in the annual Rad-NESHAP report.

EPA-required elements for the report

The annual reporting of the calculated dose along with the following information is required by the regulation.

(1) name and location of the facility
(2) list of the radioactive materials used at the facility
(3) description of the handling and processing that the radioactive materials undergo at the facility
(4) list of stacks, vents, and other release points
(5) description of effluent controls and their efficiency for each item listed for (4)
(6) distances from the release points to the nearest residence, school, business, or office and the nearest farms producing vegetables, milk, and meat
(7) all other user supplied parameters and a description of the source of these data
(8) description of construction and modifications reviewed for applications
(9) certification signatures

Required report information and data, continued

EPA Compliance Agreement requirements for the report

The FFCA-required elements are:

(1) List of nonpoint sources generally identified by Technical Area.

(2) Dose contributions from nonpoint sources as determined by environmental sampling results of the compliance stations portion of the Ambient Air Sampling Network (AIRNET), and dose contributions from nonpoint sources of activated-gas emissions.

(3) Total annual run time and sample completeness for AIRNET

DOE requirements for the report

The DOE has required additional formatting and reporting requirements for the annual report (contact the local DOE office for the latest version). To be provided is a discussion of environmental monitoring results related to air emissions. Additional DOE reporting requirements include:

- the site-wide population dose
- compliance status with 40 CFR 61, Subpart H
- compliance status with 40 CFR 61, Subparts Q & T if pertinent
- a discussion of radon emissions, if pertinent
- a discussion of thoron emissions, if pertinent

The DOE suggests the report be divided into four major sections, as below:

- Section I. Facility Information
- Section II. Air Emissions Data
- Section III. Dose Assessment
- Section IV. Constructions / Modifications
- Appendix. Additional Information

The DOE usually provides the document that specifies the above information. Revision to DOE guidance may specify a different format and content than given above. For example, additional information usually includes a discussion of unplanned air releases. Any revised DOE specifications supersede the format given above.

Other suggested report elements

Other elements of the report have been added to make the report more readable for the lay-person. These include:

- Banner or title page that provides the annual dose and facility contacts.
- Abstract or introduction describing the purpose and report content.
- Executive summary that summarizes the report and mentions important events related to the RAD-NESHAPs program at LANL.
- Summary and/or analysis of any accidental or unplanned emissions of radionuclides to the air.

How to obtain report data

(1) Name and location of the facility

Provide the facility name ("Los Alamos National Laboratory") in the first part of the report. Describe the general location of LANL and provide maps and figures showing the location of LANL within northern NM. Provide a map showing the location of LANL technical areas. Figures for maps can be obtained from group CIC-1 by calling the customer service desk at 7-4636. Maps should be updated as needed.

(2) Radioactive materials used at the facility

A list of the radioactive materials used by the facility must be provided. For the report, this information should be provided in three formats. Provide a brief description of the 'materials used' in Section I of the report. This information can be obtained from written reports (e.g., Facility Safety Analysis Reports, inventory reports, etc.) or from facility representatives

Provide a table in Section II of the report that lists the actual emissions detected for each release point. These data are obtained from the LANL stack-monitoring program within the RAD-NESHAP project. Based on the actual radionuclides detected in effluent, some radionuclide emissions are estimated and added to the dose assessment model input.

Steps to obtain data

The following steps describe how emissions data are obtained for the report.

Step	Action
1	Obtain electronic copies of the emissions detected by release point from MAQ's 'RADAIR' database.
2	Construct a table of the measured and estimated radionuclide emissions by release point into a format suitable for the report and the dose assessment model.
3	At least every two years, MAQ obtains a "usage survey" of radioactive materials from each facility manager of LANL sites to estimate potential emissions from unsampled release points. Obtain this information from appropriate Rad-NESHAP project personnel.

(3) Radioactive materials handling and processing

Provide a description of the handling and processing that the radioactive materials undergo at the facility. This information can be obtained by contacting the facility managers or reviewing ES&H records.

How to obtain report data, continued

(4) List of stack, vents, and other release points

Rad-NESHAP project personnel maintain this information. Electronic copies can be obtained from the 'release_points' MS-Access database. Release point information in the table named "stacks" is updated as needed.

(5) Description of release point effluent controls

Rad-NESHAP project personnel maintain this information. Electronic copies can be obtained from the 'release_points' MS-Access database. Release point information in the table named "stacks" is updated as needed.

(6) Distance from release points to receptors

Determine the distances from each release point to the nearest residence, school, business, or office and the nearest production farms. ESH and LANL engineers maintain this information. Electronic copies can be obtained from the 'release_points' MS-Access database; information in the table named "receptors" is updated as needed. This information is also available in the report LA-13469-MS, "Population Array and Agricultural Data Arrays for the Los Alamos National Laboratory."

Steps to find distances

The following is a suggested list of steps to follow to verify potential receptor locations for LANL airborne release sites.

Step	Action
1	Obtain current maps of the LANL area. The maps should depict roads, structures, and the DOE/LANL boundaries.
2	Once per year, but prior to the report due date of the relevant year, tour the facility boundary to identify any new receptor locations. Delineate on a map the approximate location of any new or potential receptor locations.
3	If no new receptors are found, skip to step 8.

Steps continued on next page.

How to obtain report data, continued

Step	Action
4	If new or potential receptor locations are found, record and determine, as well as possible, the geo-spatial coordinates for the location. A number of mapping systems could be applied to determine the geo-spatial coordinates of new receptors: • LANL Mapping Systems (GIS-LAB, EES-9, RRES-ECO, and the KSL infrastructure and map service) • County Plat Maps at Los Alamos County Clerk's Office • GPS System • USGS Mapping Data • US Census TIGER Data
5	If necessary, convert the coordinates into the standard coordinate system used by MAQ, currently NM State Plane, NAD83.
6	Once the coordinates of the receptor(s) are determined, add them to the appropriate database (if used).
7	Determine if the new or potential location has become the nearest receptor for release points in the area. Revise the 'distance to nearest receptor' field in the database accordingly.
8	Once per year, provide a list of new or potential receptor locations. Also include a brief description of the facility tour and the mapping system used in a memo to file and to the Rad-NESHAP health physicists responsible for the annual dose assessment calculations. If no new potential receptor locations were identified, note so in a summary. Be sure to specify the date when the facility tour was completed.

How to obtain report data, continued

(7) User supplied parameters

The report should include all of the user-supplied data, that is, site-specific data that were used in the dose assessment model. These data should include information on the following items:

- stack parameters
- highest effective dose equivalent location
- individual stack receptor locations
- climate data
- wind frequency arrays
- population arrays
- agricultural arrays
- food supply fractions
- measured and estimated emissions from point sources
- measured and estimated emissions from nonpoint sources
- AIRNET summary

This information is maintained in the following MAQ databases:

- AIRNET
- RADAIR
- Flow
- Release_points

(8) New source reviews

The report must provide a brief description of all construction and modifications completed during the report period for which the requirement to apply for approval to construct or modify was waived. The documentation developed to support the waiver should be included. The New Source Review personnel in MAQ provide this information (see memo ESH-17:99-366).

(9) Certification signatures

Add the declaration found in 40 CFR 61.94(b)(9) immediately above the signature lines. Forward the report for signature by the ESH Division Director (the facility "operator") and then for signature by the DOE Area Manager (the facility "owner").

How to obtain report data, continued

Annual dose summation without LANSCE contribution

When there is not a significant source from LANSCE (as in the past), a number of additional steps are required. The following steps will be needed for determining the maximum dose location for compliance.

Determining max dose location

To determine where the maximum dose occurred for the calendar year under evaluation, perform the following steps:

Step	Action
1	After the distance and direction to the he nearest or critical receptor for each monitored source has been obtained, make a CAP88 dose run (see MAQ-501) for that particular source and receptor. More than one run may be needed to determine the critical receptor. However, once this has been determined for a particular release point, it will not change unless newer receptors are identified.
2	Sum all of the "critical receptor" doses from step 1, along with the maximum dose as measured by AIRNET (see MAQ-502), then an absolute cap on the annual dose would be obtained. The actual highest offsite dose equivalent will be less.
3	Examine and rank both the AIRNET doses and Stack doses to develop a set of likely candidate locations to be evaluated for determining the place of the highest offsite dose. There will normally be 3 or 4 most likely candidates.
4	(Optional) To provide thoroughness and enhance credibility, the **preparer** may elect to evaluate additional locations for highest offsite dose determination in addition to those identified in Step 3. The **preparer** should generate a unique location names and a rough X,Y coordinate value for each location to be evaluated. For instance, additional locations to be evaluated could be those of interest to the general public (for example, those suggested by the Citizens' Advisory Board). A map showing suggested receptor locations is included as attachment 1. A table listing some suggested receptor locations is included as attachment 2.
5	To determine the actual location of highest offsite dose, perform a set of CAP88 runs for a set of most likely candidates obtained in Step 3 and 4. Each location has a unique name and X-Y location. A spreadsheet or database could be used to sum the doses by each unique location to determine the highest offsite dose location for reporting purposes.

Steps continued on next page.

How to obtain report data, continued

Step	Action
6	Once the highest dose location has been determined in step 5, perform CAP88 runs and generate the necessary output files for the CAP88 verification and validation process, see the following section on quality assurance.
7	Construct the necessary dose summary tables for the annual report; verify through peer review that the correct numbers have been entered into the tables.

Generating the annual Rad-NESHAP report

Source of information

Most of the required information is in tables in the AIRNET, RADAIR, Flow, and release_points databases. Use the appropriate reports in these databases to obtain information for the period of interest.

Assemble the required report information

Assemble the information into the report following the format requested by the latest DOE guidance document, as follows (**NOTE**: This specified format may change if DOE provides an updated guidance document. See the block "DOE requirements for the report" on page 6):

- Section I, "Facility Information:" EPA requirements (1) through (6)
- Section II, "Air Emissions Data:" include air emissions data for each monitored source.
- Section III, "Dose Assessment:" EPA requirements (7) and (9), and FFCA requirements (1) and (2)
- Section IV, "Constructions / Modifications:" EPA requirement (8).
- Appendix: DOE requirements for additional Information.

Quality assurance of reported information

Data quality assurance

Take appropriate steps to ensure the quality of all data used in the report, according to requirements in the Rad-NESHAP Quality Assurance Project Plan (MAQ-RN). Ensure the records used for source information for the report have been peer reviewed for accuracy and completeness. Critical information such as dose assessment records must undergo a technical review process by individuals independent of the dose assessment process (see below).

Software quality assurance

Follow the requirements in the MAQ QMP for software quality assurance when using software to generate or manipulate information to be included in the NESHAP report. Although not required for compliance to 40 CFR 61 Subpart H, the recommendations found in DOE-EH-89-9 bulletin, "Technical Software Quality Assurance Issues" and DOE-EH-91-1 bulletin, "Computer Code Quality Assurance" emphasize that

1) the software adequately and correctly performs all intended functions
2) software users should have a thorough understanding of the software they are using.

Technical review of dose assessment and other critical information

Technical or quality reviews of dose assessment records must be conducted as described below and in procedure MAQ-501. Reviews ensure the quality of the work and identify deficiencies. Reviews should include three levels of staff responsibility: author, technical reviewer, and approver. The objectives of the review process are to verify accuracy and completeness of the information provided to the EPA. The steps provided below describe how to review dose assessments (see MAQ-501). These steps could also be followed for other critical calculations/information required in the report.

Steps to conduct technical review of dose assessments

To obtain the technical and peer reviews of critical report information, perform the following steps:

Step	Action
1	The **author** (preparer or generator) of a dataset provides the first level of review. A checklist of items for the author to review is given as an attachment to MAQ-501.

Steps continued on next page.

Quality assurance of reported information, continued

Step	Action
2	The **author** certifies with the checklist that the review is comprehensive, and signs and dates the dose assessment to certify the review has been completed. The author forwards the dose assessment to the technical reviewer.
3	The **technical reviewer** (who should be a qualified Health Physicist) provides a peer review of the dose assessment and report information. The reviewer conducts an overall review of the dose assessment records to ensure the information provided in the report is accurate and complete. The **technical reviewer** verifies that the author has completed the checklist review and has signed and dated the dose assessment.
4	The **technical reviewer** certifies completion of the peer review process by signing and dating the appropriate signature block on the dose assessment record. The **technical reviewer** then forwards the records to the approver.
5	The **approver** (an MAQ member other than one who performed the dose assessment work, preferably a project leader) reviews the dose assessment records and certifies the review and acceptance of the records by signing the appropriate signature block on the dose assessment record(s).

Records of report generation

A record contains information that is retained for its expected future value. Records should be sufficient to support technical and regulatory decisions. Records and documents may be electronic, written, or printed. Other acceptable record formats may also include: microfilm, photographs, radiographs, or laser disks.

The **author** forwards the records to the MAQ records coordinator. See the list in the next chapter *Records resulting from this procedure* for the list of records that must be filed. File additional records as suggested above and as appropriate to assist in potential future reviews of the report and its preparation.

Records resulting from this procedure

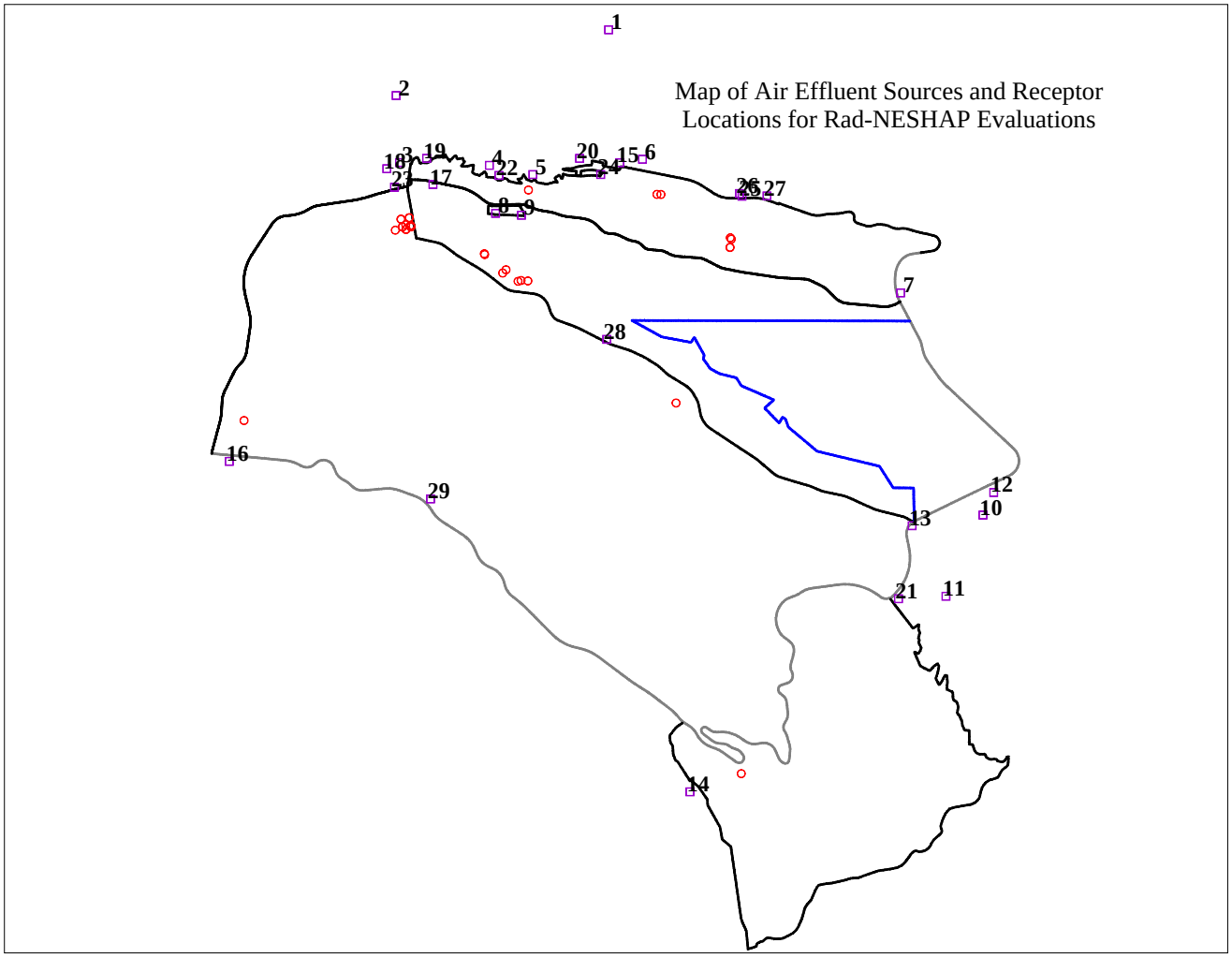
Records

The following written or printed records generated as a result of this procedure are to be submitted **within four weeks after the annual report is submitted** as records to the records coordinator:

- Revised list of receptors (if any)
- Annual RAD-NESHAP Report to DOE and EPA
- Documentation of all reviews

ATTACHMENT 1

AIR EFFLUENT SOURCES AND RECEPTOR LOCATIONS FOR RAD-NESHAP EVALUATIONS



ATTACHMENT 2

SUGGESTED RECEPTOR LOCATIONS FOR RAD-NESHAP EVALUATIONS

Easting	Northing	#	Location
1630910	1783870	1	Barranca School
1776052	1776052	2	Urban Park
1618602	1776052	3	4309 Fairway Drive
1623892	1775889	4	Shell Gas Station LA
1626450	1775350	5	LA McDonalds
1632902	1776247	6	Airport Los Alamos
1648105	1768380	7	Tsankawi Visitors Area
1624256	1773065	8	Royal Crest Trailer Court W
1625778	1772955	9	Royal Crest Trailer Court E
1652950	1755300	10	Near Rocket Park WR
1650770	1750520	11	Pajarito Acres
1653580	1756630	12	WR Fire Station 1
1648778	1754676	13	WR Nazarene Church
1635700	1739005	14	Bandelier Fire Lookout
1631568	1776046	15	985 Nambe Loop
1608580	1758460	16	Ponderosa Campground
1620569	1774763	17	County Landfill Office
1617852	1775692	18	Ice Rink Los Alamos
1620200	1776300	19	Los Alamos Hospital
1629200	1776300	20	Cross Roads Bible Church
1647976	1750376	21	165 Monte Rey South
1624450	1775300	22	Los Alamos Inn-S
1618300	1774600	23	TA3 Research Park
1630445	1775350	24	DP Road Business
1638765	1774075	25	2470 East Gate Drive
1638616	1774231	26	East Gate Mobile Home
1640230	1774090	27	EG&G office
1630800	1765650	28	TA46-88-ICON
1620430	1756250	29	TA49-153-ForestService